Docket No.: 46030/P045US/10407184
(PATENT)

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re Patent Application of:
Timothy E. Ostromek et al.

Application No.: 10/759,959 Confirmation No.: 8182

Filed: January 16, 2004 Art Unit: 2622

For: COMBINING MULTIPLE SPECTRAL BANDS TO GENERATE AN IMAGE Examiner: A. H. Cutler

APPEAL BRIEF

MS Appeal Brief - Patents
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Dear Sir:

As required under 37 C.F.R. § 41.37(a), this brief is filed within two months of the Notice of Appeal filed in this case on June 24, 2008, and is in furtherance of said Notice of Appeal.

The fees required under 37 C.F.R. § 41.20(b)(2) are dealt with in the accompanying TRANSMITTAL OF APPEAL BRIEF.

This brief contains items under the following headings as required by 37 C.F.R. § 41.37 and M.P.E.P. § 1206:

IX. Evidence Appendix
X. Related Proceedings Appendix

I. REAL PARTY IN INTEREST

The real party in interest for this appeal is:

L-3 Communications Corporation, a Delaware corporation, having a business address of 10001 Jack Finney Boulevard, Greenville, Texas 75402.

II. RELATED APPEALS, INTERFERENCES, AND JUDICIAL PROCEEDINGS

There are no other appeals, interferences, or judicial proceedings which will directly affect or be directly affected by or have a bearing on the Board's decision in this appeal.

III. STATUS OF CLAIMS

A. Total Number of Claims in Application

There are 19 claims pending in the application.

B. Current Status of Claims

1. Claims canceled: 4, 10, 16
2. Claims withdrawn from consideration but not canceled: None
3. Claims pending: 1-3, 5-9, 11-15, 17-22
4. Claims allowed: None
5. Claims rejected: 1-3, 5-9, 11-15, 17-22

C. Claims On Appeal

The claims on appeal are claims 1-3, 5-9, 11-15, 17-22.

IV. STATUS OF AMENDMENTS

Applicant filed an Amendment After Final Rejection on August 22, 2008, amending claim 13 and the specification to further prosecution in light of objections made. Because this Appeal Brief is filed immediately after the filing of the Amendment After Final Rejection, Appellant has not been informed that the amendments have or have not been entered.

V. SUMMARY OF CLAIMED SUBJECT MATTER

A concise explanation of the subject matter defined in each of the claims separately argued in this appeal, which refers to the specification and to the drawings by reference characters, is provided below. All references to the specification and drawings are made by way of example for the convenience of the Board, as it is possible that other areas of the specification and drawings may contain further descriptive material. No limitations on the meaning of the following claim language is intended.

According to claim 1, a method for generating an image comprises receiving light associated with a plurality of spectral bands (e.g., 100 of FIGURE 4 and page 10, lines 23-24, page 5, lines 13-25), and repeating the following for each spectral band associated with the light, receiving an electrical signal at an electro-optical element (e.g., 22 of FIGURE 1, page 5, line 27-page 6, line 2), changing an optical property of the electro-optical element in response to the electrical signal to filter for a spectral band (e.g., page 6, lines 7-32), and transmitting the spectral band to a sensor (e.g., page 7, line 12-page 8, line 4). The method further includes sensing the spectral bands at the sensor and combining the spectral bands to generate a composite signal (e.g., 104 and 108 of FIGURE 4, page 7, line 12-page 8, line 18). Combining the spectral bands to generate the composite signal comprises accessing a function of the spectral bands (e.g., page 8, lines 5-18), multiplexing the spectral bands in accordance with the function to combine the spectral bands (e.g., 108 of FIGURE 4, page 8, lines 5-18), said function causing said spectral bands to be combined using at least one of: adding and weighted combining (e.g., page 8, lines 5-18), and generating an image from the composite signal (e.g., 110 of FIGURE 4 and page 8, line 19-page 9, line 11).

According to independent claim 7, a system (10 of FIGURE 1) for generating an image comprises an electro-optical element (e.g., 22 of FIGURE 1) operable to receive light associated with a plurality of spectral bands (e.g., page 5, lines 13-25) and repeats the following for each spectral band associated with the light: receive an electrical signal (e.g., page 5, line 27-page 6, line 2), change an optical property of the electro-optical element in response to the electrical signal to filter for a spectral band (e.g., page 6, lines 7-32) and transmit the spectral band to a sensor (e.g., page 7, line 12-page 8, line 4). The system also includes a sensor (e.g., 24 of FIGURE 1 and page 7, line 12-page 8, line 4) coupled to the electro-optical element and operable to sense the spectral bands, as well as an image processing module (e.g., 26 of FIGURE 1 and page 8, lines 5-18) coupled to the sensor. This image processing module is operable to combine the spectral bands to generate a composite signal by accessing a function of the spectral bands (e.g., page 8, lines 5-18) and multiplexing the spectral bands in accordance with the function to combine the spectral bands. This function is selected from a list consisting of an adding function, a dividing function, and a weighting function (e.g., page 8, lines 5-18). In addition, the system includes a display module coupled to the image processing module and operable to generate an image from the composite signal (e.g., 30 of FIGURE 1 and page 8, line 19-page 9, line 11).

According to independent claim 13, a logic for generating an image and embodied in a medium (e.g., page 9, lines 21-24) and operable to receive light associated with a plurality of spectral bands (e.g., 100 of FIGURE 4 and page 10, lines 23-24, page 5, lines 13-25), which repeats the following for each spectral band associated with the light: receive an electrical signal at an electro-optical element (e.g., 22 of FIGURE 1, page 5, line 27-page 6, line 2), change an optical property of the electro-optical element in response to the electrical signal to filter for a spectral band (e.g., page 6, lines 7-32); and transmit the spectral band to a sensor (e.g., page 7, line 12-page 8, line 4). The logic senses the spectral bands at the sensor (e.g., 104 of FIGURE 4, page 7, line 12-page 8, line 18) and combines the spectral bands to generate a composite signal by accessing a function of the spectral bands and multiplexing the spectral bands in accordance with the function to combine the spectral bands This function causes said spectral bands to be combined using at least one of: adding and weighted combining (e.g., 108 of FIGURE 4, page 8,

lines 5-18). The logic also generates an image from the composite signal (e.g., page 8, line 19-page 9, line 11), wherein said medium comprises hardware (e.g., page 9, lines 21-24).

According to independent claim 19, a system for generating an image (e.g., 10 of FIGURE 1) comprises a means for receiving light associated with a plurality of spectral bands (e.g., 22 of FIGURE 1 and page 6, line 7-page 7, line 11) and a means for repeating the following for each spectral band associated with the light (e.g., 22 and 20 of FIGURE 1, page 6, line 7-page 7, line 11, and page 5, line 30-page 6, line 6): receiving an electrical signal at an electro optical element (e.g., page 5, lines 13-25), changing an optical property of the electro-optical element in response to the electrical signal to filter for a spectral band (e.g., page 6, lines 7-32) and transmitting the spectral band to a sensor (e.g., page 7, line 12-page 8, line 4). The system also contains a means for sensing the spectral bands at the sensor (e.g., 24 of FIGURE 1 and page 7, line 12-page 8, line 4 and page 9, lines 12-24), as well as a means for combining the spectral bands to generate a composite signal (e.g., 26 of FIGURE 1 and page 8, lines 5-18 and page 9, lines 12-24). The means for combining the spectral bands to generate the composite signal comprises means for accessing a function of the spectral bands (e.g., 26 of FIGURE 1 and page 8, lines 5-18 and page 9, lines 12-24) and means for multiplexing the spectral bands in accordance with the function to combine the spectral bands. This function selected from a list consisting of an adding function, a dividing function, and a weighting function (e.g., 26 of FIGURE 1 and page 8, lines 5-18 and page 9, lines 12-24). The system also comprises a means for generating an image from the composite signal (e.g., 30 of FIGURE 1, page 8, line 19-page 9, line 11).

According to independent claim 20, a method for generating an image comprises receiving light associated with a plurality of spectral bands (e.g., 100 of FIGURE 4 and page 10, lines 23-24, page 5, lines 13-25) and repeating the following for each spectral band associated with the light: receiving an electrical signal at an electro optical element, comprised of a first layer sensitive to a first spectral band of the spectral bands, and a second layer sensitive to a second spectral band of the spectral bands, the electrical signal operable to activate the first layer and to activate the second layer, the electro-optical element further comprising a first section sensitive to a first spectral band of the spectral bands, and comprising a second section sensitive

to a second spectral band of the spectral bands, the electrical signal operable to activate the first section and to activate the second section (FIGURES 2A-C and page 9, line 25-page 10, line 9); changing an optical property of the electro-optical element in response to the electrical signal to filter for a spectral band (e.g., page 6, lines 7-32) and transmitting the spectral band to a sensor (e.g., page 7, line 12-page 8, line 4). The method also includes sensing the spectral bands at the sensor, the sensor synchronized with the electro-optical element, the sensor being operable to sense a spectral band when the spectral band arrives at the sensor from the electro-optical element (e.g., page 7, lines 25-28) and combining the spectral bands to generate a composite signal by accessing a function of the spectral bands, and by multiplexing the spectral bands in accordance with the function to combine the spectral bands, the function causing said spectral bands to be combined using at least one of: adding and weighted combining (e.g., page 8, lines 5-18). In addition, the system comprises generating an image from the composite signal by receiving the composite signal, which is associated with a plurality of display spectral bands and repeating the following for each display spectral band associated with the composite signal: sending a display electrical signal to a display electro-optical element, changing an optical property of the display electro-optical element in response to the display electrical signal to filter for a display spectral band, and transmitting the display spectral band to a display (e.g., page 9, lines 6-11). The system also includes displaying the display spectral bands at the display to generate the image (e.g., page 8, line 19-page 9, line 11).

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

First Ground of Rejection—Claims 1, 5, 7, 11, 13, 17, 19, 21, and 22 are rejected under 35 U.S.C. §103(a) as being unpatentable over EP 1,051,045 (hereinafter, Daly) in view of US 5,936,245 (hereinafter, Guillot).

Second Ground of Rejection—Claims 2, 3, 8, 9, 14, and 15 are rejected under 35 U.S.C. §103(a) as being unpatentable over Daly in view of Guillot in further view of US 5,528,295 (hereinafter, Wagner).

Third Ground of Rejection—Claims 6, 12, and 18 are rejected under 35 U.S.C. §103(a) as being unpatentable over Daly in view of Guillot in further view of US 5,347,378 (hereinafter, Handschy).

Fourth Ground of Rejection—Claim 20 is rejected under 35 U.S.C. §103(a) as being unpatentable over Daly in view of Guillot in further view of Wagner in further view of Handschy.

VII. ARGUMENT

A. First Ground of Rejection

Claims 1, 5, 7, 11, 13, 17, 19, 21, and 22 are rejected under 35 U.S.C. §103(a) as being unpatentable over Daly in view of Guillot. Appellant respectfully requests that the rejection be reversed at least because of the reasons articulated below.

In combining Daly and Guillot, the Examiner would cause the system of Daly to be unable to combine image fields into frames. "If proposed modification would render the prior art invention being modified unsatisfactory for its intended purpose, then there is no suggestion or motivation to make the proposed modification." M.P.E.P. §2143.01(V), citing In re Gordon, 733 F.2d 900, 221 USPQ 1125 (Fed. Cir. 1984). Thus, in this case, the proposed combination is improper.

The Daly invention is a method and system for field sequential color image capture, and it is best illustrated in Daly's Fig. 8 and the passage at column 11, line 25 through column 12, line 5. Daly captures three different color fields (also called "planes," and they are B, Y, and R) for each frame using an active color filter 84 and a monochrome sensor 90. Daly at Col. 11, lines 25-31. Color filter 84 passes one color component at a time to sensor 90, which samples the color component. Id. Each of the three fields is distributed to a respective channel U (94), Y (96), and V (98). Id. at 42-46. The fields in the three channels are aligned in time by the array field selector 92 and then stored in memory as three different color images per frame. Id. After filtering, each of the three field images are combined into a frame image by field-to-frame

combiner 118. Id. at Col. 11, line 57 - Col. 12, line 1. In other words, each of the fields is a discrete, color component image that is stored in memory and combined by the field-to-frame combiner 118 to make a frame.

The rejections of independent claims 1, 7, 13, and 19 proposes replacing the combining technique of Daly with the combining technique of Guillot. See Final Office Action at 5, 8, 11, and 14. However, Daly and Guillot perform combining in different ways. Unlike Daly, Guillot does not combine discrete fields, stored in memory, into frames. Rather, Guillot combines video signals, as shown in Fig. 4 and Equations 1 and 2 of Guillot. See Guillot at Col. 5, lines 30-50. Thus, Daly teaches combining a first set of discrete images (fields) into a second set of discrete images (frames). By contrast, Guillot teaches using the Equations 1 and 2 found in the passage at Col. 5, lines 35-43 and Fig. 4 of Guillot. Guillot teaches that Equations 1 and 2 are for combining signals, not for combining fields into frames. Therefore, replacing the field combining functions of Daly (performed by field-to-frame combiner 118) with the signal combining equations of Guillot would result in a system unable to combine fields, thereby making the system of Daly unfit. Accordingly, the combination of Daly and Guillot is improper, and the rejection of claims 1, 5, 7, 11, 13, 17, 19, 21, and 22 should be reversed.

B. Second Ground of Rejection

Claims 2, 3, 8, 9, 14, and 15 are rejected under 35 U.S.C. §103(a) as being unpatentable over Daly in view of Guillot in further view of Wagner. As shown above, the combination of Daly and Guillot is improper, as it renders the system of Daly unfit for its intended purpose. The rejection of claims 2, 3, 8, 9, 14, and 15 adds Wagner; however, the addition of Wagner does not cure the deficiency in the combination of Daly and Guillot. Thus, the rejection of Daly, Guillot, and Wagner is improper as it renders the system of Daly unfit for its intended purpose. Accordingly, the rejection of claims 2, 3, 8, 9, 14, and 15 should be reversed.

C. Third Ground of Rejection

Claims 6, 12, and 18 are rejected under 35 U.S.C. §103(a) as being unpatentable over Daly in view of Guillot in further view of Handschy. As shown above, the combination of Daly

and Guillot is improper, as it renders the system of Daly unfit for its intended purpose. The rejection of claims 6, 12, and 18 adds Handschy; however, the addition of Handschy does not cure the deficiency in the combination of Daly and Guillot. Thus, the rejection of Daly, Guillot, and Handschy is improper as it renders the system of Daly unfit for its intended purpose. Accordingly, the rejection of claims 6, 12, and 18 should be reversed.

D. Fourth Ground of Rejection

Claim 20 is rejected under 35 U.S.C. §103(a) as being unpatentable over Daly in view of Guillot in further view of Wagner in further view of Handschy. As shown above, the combination of Daly and Guillot is improper, as it renders the system of Daly unfit for its intended purpose. The rejection of claim 20 adds Wagner and Handschy; however, the addition of Wagner and Handschy does not cure the deficiency in the combination of Daly and Guillot. Thus, the rejection of Daly, Guillot, Wagner, and Handschy is improper as it renders the system of Daly unfit for its intended purpose. Accordingly, the rejection of claim 20 should be reversed.

VIII. CLAIMS APPENDIX

A copy of the claims involved in the present appeal is attached hereto as Appendix A. Claim 13 does include the amendment of August 22, 2008.

IX. EVIDENCE APPENDIX

No evidence pursuant to §§ 1.130, 1.131, or 1.132 or entered by or relied upon by the examiner is being submitted.

X. RELATED PROCEEDINGS APPENDIX

No related proceedings are referenced in II. above, hence copies of decisions in related proceedings are not provided.

Dated: August 25, 2008

Respectfully submitted,

By_____

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I hereby certify that this paper (along with any paper referred to as being attached or enclosed) is being transmitted via the Office electronic filing system in accordance with § 1.6(a)(4).

Dated: August 25, 2008

Signature: _____
Donna Dobson

APPENDIX A

The claims on appeal (*i.e.*, not including withdrawn or canceled claims) are as follows:

1. A method for generating an image, comprising:

receiving light associated with a plurality of spectral bands;

repeating the following for each spectral band associated with the light:

receiving an electrical signal at an electro-optical element;

changing an optical property of the electro-optical element in response to the electrical signal to filter for a spectral band; and

transmitting the spectral band to a sensor;

sensing the spectral bands at the sensor;

combining the spectral bands to generate a composite signal, wherein combining the spectral bands to generate the composite signal comprises:

accessing a function of the spectral bands; and

multiplexing the spectral bands in accordance with the function to combine the spectral bands, said function causing said spectral bands to be combined using at least one of: adding and weighted combining; and

generating an image from the composite signal.

2. The method of Claim 1, wherein the electro-optical element comprises:

a first layer sensitive to a first spectral band of the spectral bands; and

a second layer sensitive to a second spectral band of the spectral bands, the electrical signal operable to activate the first layer and to activate the second layer.

3. The method of Claim 1, wherein the electro-optical element comprises:

a first section sensitive to a first spectral band of the spectral bands; and

a second section sensitive to a second spectral band of the spectral bands, the electrical signal operable to activate the first section and to activate the second section.

5. The method of Claim 1, wherein the sensor is synchronized with the electro-optical element, the sensor being operable to sense a spectral band when the spectral band arrives at the sensor from the electro-optical element.

6. The method of Claim 1, wherein generating the image from the composite signal comprises:

receiving the composite signal, the composite signal associated with a plurality of display spectral bands;

repeating the following for each display spectral band associated with the composite signal:

sending a display electrical signal to a display electro-optical element;

changing an optical property of the display electro-optical element in response to the display electrical signal to filter for a display spectral band; and

transmitting the display spectral band to a display; and

displaying the display spectral bands at the display to generate the image.

7. A system for generating an image, comprising:

a electro-optical element operable to:

receive light associated with a plurality of spectral bands;

repeat the following for each spectral band associated with the light:

receive an electrical signal;

change an optical property of the electro-optical element in response to the electrical signal to filter for a spectral band; and

transmit the spectral band to a sensor;

a sensor coupled to the electro-optical element and operable to sense the spectral bands;

an image processing module coupled to the sensor and operable to combine the spectral bands to generate a composite signal, wherein the image processing module combines the spectral bands to generate the composite signal by:

accessing a function of the spectral bands; and

multiplexing the spectral bands in accordance with the function to combine the spectral bands, said function selected from a list consisting of: an adding function, a dividing function, and a weighting function; and

a display module coupled to the image processing module and operable to generate an image from the composite signal.

8. The system of Claim 7, wherein the electro optical element comprises:

a first layer sensitive to a first spectral band of the spectral bands; and

a second layer sensitive to a second spectral band of the spectral bands, the electrical signal operable to activate the first layer and to activate the second layer.

9. The system of Claim 7, wherein the electro-optical element comprises:

a first section sensitive to a first spectral band of the spectral bands; and

a second section sensitive to a second spectral band of the spectral bands, the electrical signal operable to activate the first section and to activate the second section.

11. The system of Claim 7, wherein the sensor is synchronized with the electro-optical element, the sensor being operable to sense a spectral band when the spectral band arrives at the sensor from the electro-optical element.

12. The system of Claim 7, wherein the display module is operable to generate the image from the composite signal by:

receiving the composite signal, the composite signal associated with a plurality of display spectral bands;

repeating the following for each display spectral band associated with the composite signal:

sending a display electrical signal to a display electro-optical element;

changing an optical property of the display electro-optical element in response to the display electrical signal to filter for a display spectral band; and

transmitting the display spectral band to a display; and

displaying the display spectral bands at the display to generate the image.

13. A logic for generating an image, the logic embodied in a medium and operable to:

receive light associated with a plurality of spectral bands;

repeat the following for each spectral band associated with the light:

receive an electrical signal at an electro-optical element;

change an optical property of the electro-optical element in response to the electrical signal to filter for a spectral band; and

transmit the spectral band to a sensor;

sense the spectral bands at the sensor;

combine the spectral bands to generate a composite signal by accessing a function of the spectral bands and multiplexing the spectral bands in accordance with the function to combine the spectral bands, said function causing said spectral bands to be combined using at least one of: adding and weighted combining; and

generate an image from the composite signal,

wherein said medium comprises hardware.

14. The logic of Claim 13, wherein the electro-optical element comprises:

a first layer sensitive to a first spectral band of the spectral bands; and

a second layer sensitive to a second spectral band of the spectral bands, the electrical signal operable to activate the first layer and to activate the second layer.

15. The logic of Claim 13, wherein the electro-optical element comprises:

a first section sensitive to a first spectral band of the spectral bands; and

a second section sensitive to a second spectral band of the spectral bands, the electrical signal operable to activate the first section and to activate the second section.

17. The logic of Claim 13, wherein the sensor is synchronized with the electro-optical element, the sensor being operable to sense a spectral band when the spectral band arrives at the sensor from the electro-optical element.

18. The logic of claim 13, operable to generate the image from the composite signal by:

receiving the composite signal, the composite signal associated with a plurality of display spectral bands;

repeating the following for each display spectral band associated with the composite signal:

sending a display electrical signal to a display electro-optical element;

changing an optical property of the display electro-optical element in response to the display electrical signal to filter for a display spectral band; and

transmitting the display spectral band to a display; and

displaying the display spectral bands at the display to generate the image.

19. A system for generating an image, comprising:

means for receiving light associated with a plurality of spectral bands;

means for repeating the following for each spectral band associated with the light:

receiving an electrical signal at an electro optical element;

changing an optical property of the electro-optical element in response to the electrical signal to filter for a spectral band; and

transmitting the spectral band to a sensor;

means for sensing the spectral bands at the sensor;

means for combining the spectral bands to generate a composite signal, wherein the means for combining the spectral bands to generate the composite signal comprises:

means for accessing a function of the spectral bands; and

means for multiplexing the spectral bands in accordance with the function to combine the spectral bands, said function selected from a list consisting of: an adding function, a dividing function, and a weighting function; and

means for generating an image from the composite signal.

20. A method for generating an image, comprising:

receiving light associated with a plurality of spectral bands;

repeating the following for each spectral band associated with the light:

receiving an electrical signal at an electro optical element, the electro-optical element comprising a first layer sensitive to a first spectral band of the spectral bands, and comprising a second layer sensitive to a second spectral band of the spectral bands, the electrical signal operable to activate the first layer and to activate the second layer, the electro-optical element further comprising a first section sensitive to a first spectral band of the spectral bands, and comprising a second section sensitive to a second spectral band of the spectral bands, the electrical signal operable to activate the first section and to activate the second section;

changing an optical property of the electro-optical element in response to the electrical signal to filter for a spectral band; and

transmitting the spectral band to a sensor;

sensing the spectral bands at the sensor, the sensor synchronized with the electro-optical element, the sensor being operable to sense a spectral band when the spectral band arrives at the sensor from the electro-optical element;

combining the spectral bands to generate a composite signal by accessing a function of the spectral bands, and by multiplexing the spectral bands in accordance with the function to combine the spectral bands, said function causing said spectral bands to be combined using at least one of: adding and weighted combining; and

generating an image from the composite signal by:

receiving the composite signal, the composite signal associated with a plurality of display spectral bands;

repeating the following for each display spectral band associated with the composite signal: sending a display electrical signal to a display electro-optical element, changing an optical property of the display electro-optical element in response to the display electrical signal to filter for a display spectral band, and transmitting the display spectral band to a display; and

displaying the display spectral bands at the display to generate the image.

21. The method of Claim 1, wherein said plurality of spectral bands comprises at least one spectral band of infrared light.

22. The system of Claim 7, wherein said plurality of spectral bands comprises at least one spectral band of a visible spectrum and at least one spectral band of infrared light.

EVIDENCE APPENDIX

None

RELATED PROCEEDINGS APPENDIX

None